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RECENT LITERATURE.

Sixth Annual Report of the U. S. Geological Survey.[1]—The sixth annual report of the survey under Major J. W. Powell is issued two years after the period to which it refers, and hence the accounts of progress which the volume contains are somewhat antiquated by the time they reach the public. This, however, is presumably the fault of the government printing-office, and not of the survey. Old as the news thus is, a few data may not prove uninteresting. The annual report for the fiscal year ending June 30, 1885, shows that the expense of the survey aggregated within a few hundred dollars of the appropriation of half a million. During the year, the topographical survey was completed and maps prepared for the engraver of fifty-seven thousand square miles of territory, at an average expense of three dollars per square mile. The usual administrative reports by the heads of the divisions appear in their proper sequence, and from them we learn that in the future relief-cuts are to be used as much as possible in the illustration of the publications of the survey,—a decision which is to be commended when such good results are obtained as in the present volume. This will render it possible to use the same cuts over and over again when it is necessary, and also places electrotypes at the disposal of the survey. All of the heads of divisions, with one exception, enumerate their assistants, other than clerical, by name, and detail the work upon which they have been employed. A similar course in the other instance would give credit to several workers to whom it is certainly due.

The accompanying papers are five in number. Mr. L. F. Ward discusses the "Flora of the Laramie Group," and describes, from the leaves alone, many species of fossil plants. Mr. J. S. Curtis describes his modification of Plattner's method of quantitative determination of silver in an assay. The new apparatus described reminds one of the mechanical stages found on some microscopes. The three remaining papers need a much more extended notice than our space will allow.

In Southwestern Wisconsin is found an area of about ten thousand square miles which exhibits no traces of former glacial action, while all around it, for several hundred miles in every direction, all the phenomena of former glaciation are abundant. This was, as it were, an island in the great sea of ice which covered the whole northern part of the continent. Messrs. Chamberlain and Salisbury have been studying this driftless area, and their accounts are given in this report. They are, apparently, painstaking researches upon all the phenomena exhibited in the region, and, while one may not agree with all their conclusions, the paper will always have a value in connection with the question of several successive glaciations and of the formation of the loess. Their explanation of the cause of this driftless area is the same that has been advanced before,—a division of the continental ice-sheet by the high land to the north, and existence of lower channels to the right and left. This was supplemented by other influences the value of which it is difficult to estimate.

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[1] Sixth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1884–85. By J. W. Powell, Director. Washington, 1885 [1887].

Professor Shaler's study of the phenomena exhibited by the sea-coast swamps of the eastern United States is also a valuable contribution to dynamical geology. The steps, as he traces them, in the formation of a salt-marsh are first, the deposit of mud by the currents in some sheltered spot, and next, the growth of eel-grass on the mud-flats thus formed. This in turn entangles still more mud, and soon the level is raised to where other plants can grow. This process is still further complicated by the formation of sand-beaches and sand-dunes, and of these two, or even more, may be formed in succession, broken here and there by openings for the drainage of the marsh behind.

Captain Dutton's paper on the "Geology of Mount Taylor and the Zuñi Plateau of New Mexico" gives the results of six years' studies in this region,—studies which are not easily reproduced in abstract, so strange is the region described. Here were found that peculiar type of volcanic action termed by Gilbert "laccolites;" dikes of volcanic material abundant around the edge of the plateau, but rare in its interior; carboniferous strata resting directly upon those of Cambrian age, and a series of mountain-peaks and necks not easily paralleled in other parts of the world, other than this strange western region which the past twenty years have shown to be so wonderful from every geological point of view.

Packard's Fossil Arthropods.[1]—Dr. Packard has for some time been engaged in the study of fossil arthropods, and in these two memoirs gives us the results of his latest studies, the outlines of which have already been presented in the pages of the NATURALIST. The Syncarida, a proposed new group, is assigned a place intermediate between the decapods and tetradecapods. To the reviewer it would seem that the forms included are true Amphipoda, and that "Syncarida" can at most have but family rank. A wider knowledge of existing amphipods would have

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[1] "On the Syncarida, a hitherto undescribed Synthetic Group of Extinct Fossil Crustacea;" "On the Gampsonychidæ, an undescribed Family of Fossil Schizopod Crustacea;" "On the Anthracaridæ, a Family of Carboniferous Macrurous Decapod Crustacea;" "On the Carboniferous Xiphosurous Fauna of North America." By A. S. Packard Fifteenth and sixteenth memoirs of vol. iii. of the Memoirs of the National Academy of Sciences. 1887.